REMARKS/ARGUMENTS

No claims are amended. Claims 1 – 9 are presented for reconsideration by the Examiner. Claims 10 – 12 are withdrawn as directed to a distinct invention.

Claim Objections

The Examiner objects to claim 5, suggesting that line 2 be amended by inserting "a" before "shank". Applicant directs the Examiner's attention to the language of claim 5, reciting in pertinent part "a drill holder having an **axis defining shank** with a forward end defining an **insert receiving socket**." This phrase includes "axis defining shank", describing an axis defined by the shank and "an insert receiving socket" describing a socket by its function. These phrases are grammatically correct English and the Examiner's proposed amendment is believed to be unnecessary.

Claim Rejection – 35 USC § 102

Claims 5 and 7 – 9 are rejected under 35 USC § 102(e) as being anticipated by U.S. Patent No. 6,848,869 to Stokey (Stokey).

Teachings of Stokey

The Examiner's description of the Stokey drill insert spanning numbered pages 2 and 3 of the office action is incorrect. The cutting edges 67 identified by the Examiner are not formed by "an intersection of a substantially planar flute surface (86) and a substantially conical land surface (84)" as stated by the Examiner. Web thin cutting edges 67 have no relationship to the primary and secondary clearance surfaces 84 and 86, respectively. Primary and secondary clearance surfaces 84, 86 are planar surfaces that provide angular relief behind cutting edges 64. Main cutting edges 64 **do not** extend from the chisel 68 and are formed by the intersection of planar primary clearance surface 84 and a linear concave flute (not identified by a reference numeral). See Stokey, column 5, lines 1-14. The intersection of surfaces 84 and 86 is described at column 4, lines 26-32 as a "clearance cut 89" and is clearly not a cutting edge.

Stokey teaches a spot and chamfer drill insert having a point formed by the intersection of planar surfaces 82, 83. See Stokey, column 5, lines 1-14. A major focus of Stokey is the particular form or shape of the point of the drill insert, which is said to improve over prior art drill tips that "walk" and require high thrust forces during drilling. Stokey specifically teaches that it is not preferred to have a flat chisel (Stokey, column 4, lines 52 – 67). Stokey distinguishes the configuration of the disclosed drill insert from the prior art, saying, "In the present invention, the chisel 68 is typically formed as a multifaceted chisel point 68 forming a single point at the dead center 62. The point 62 of the multifaceted chisel 68 point is not as apt to wander as a flat chisel and provides increased stability which in turn helps produce very round and very accurately positioned spot cuts." (Stokey, column 4, lines 61-67) As best illustrated in Figure 3, the point 62 described in the above passage is formed at the intersection of four facets 82, 83 on one side and 82, 83 on the opposite side of the point 62. As a result, the chisel 68 is nonlinear, having two angled portions meeting at point 62.

Stokey teaches reducing the thickness of the web and the length of the chisel 68 by means of a concave arcuate "web thinning notch 66" cut into the point of the drill insert from opposite sides. The intersection of arcuate web thinning notch 66 and the web thin clearance surface 82 forms what is described as a "web thin cutting edge 67." Web thin cutting edge 67 is a curve because it is formed by the intersection of a planar point facet 82 and an arcuate web thinning notch 66 where the intersection is not parallel to the axis of curvature of the web thinning notch. That web thin cutting edge 67 is an arc is borne out by the description at column 5, lines 27 – 34, including a plane "tangent to the web thin cutting edge 67." The description at column 5, lines 23 – 65 provides a detailed description of the faceted point and makes clear that the web thin cutting edges 67 extending from chisel 68 are nonlinear and formed at the intersection of a concave arcuate, nonconical web thinning notch 66 and a planar web thin clearance surface 82.

Claims 5 and 7-9

Claim 5 recites in pertinent part as follows:

> a drill point integrally extending from an end of said insert body axially opposed to said socket mating portion, said drill point including a pair of **substantially linear cutting edges inclined rearwardly from a chisel edge at the extreme forward end of said insert, each said cutting edge defined by an intersection of a substantially planar flute surface and a substantially conical land surface**

Claim 5 recites a specific geometry for the drill point that is not disclosed, taught or suggested by Stokey. The cutting edges recited in claim 5 are formed by the intersection of "a substantially planar flute surface and a substantially conical land surface." This configuration of cutting edges is not disclosed, taught or suggested by Stokey.

It is important to distinguish the substantially conical land surface recited in claim 1 from the arcuate web thinning notch 66 shown in Stokey. Land surfaces in a cutting tool are the surfaces behind a cutting edge in the direction of rotation. Land surfaces in a cutting tool follow the cutting edge and must provide "clearance" or "relief" so they do not rub the material being cut. The land surfaces of Stokey are all planar facets, see reference numerals 82, 83, 84, 86 providing primary and secondary clearance for cutting edges 67, 64. Stokey does not disclose, teach or suggest the "substantially conical land surface" recited in claim 5.

Requirements of a rejection under 35 U.S.C. §102

According to MPEP § 2131, to anticipate a claim, **the reference must teach each and every element of the claim**. As discussed above, Stokey fails to disclose, teach or suggest the specific drill point configuration recited in claim 5 and quoted above. Claim 5 is patentable over the disclosures of Stokey.

Claims 6 – 9 depend directly or indirectly from claim 5 and are patentable for at least the reasons stated in support of claim 5.

Claim Rejections – 35 USC § 103

Claims 1 – 4 and 6 are rejected under 35 USC § 103(a) as being unpatentable over Stokey in view of U.S. Patent No. 5,288,183 to Chaconas et al (Chaconas).

As previously discussed, Stokey fails to disclose the claimed drill point configuration. Specifically, Stokey fails to disclose, teach or suggest a drill point including "cutting edges defined by an intersection of a substantially planar flute surface and a substantially conical land surface." This language is included in claims 1 and 5, reciting a specific geometry for the claimed drill point.

The Examiner admits that Stokey fails to teach a substantially conical land surface "having an axis of curvature that is offset" from the rotational axis of the drill point as recited in claims 1 and 6. The Examiner turns to Chaconas to remedy the deficiencies of Stokey.

The teachings of Chaconas

Chaconas teaches a self-centering drill bit with pilot tip. The drill bit of Chaconas is a typical twist drill modified to include a pilot tip having a split point. What the Examiner identifies as land surfaces 58, 60 are described in Chaconas as "outer surfaces 58 and 60 of pilot tip 38." Chaconas describes outer surfaces 58 and 60 of pilot tip as being formed with radial relief and a back taper. (Chaconas, column 5, lines 28-45) Chaconas teaches a pilot tip 38 having relief surfaces 50 and 52 to provide the necessary clearance to "minor cutting lips 46, 48." Angular notches thin the chisel 44 and define further cutting edges 40, 42. Chaconas does not disclose, teach or suggest that the land surfaces 50, 52 of the pilot point 38 are conical or, if conical, have an axis of curvature that is offset from the axis of rotation of the drill point 38.

Motivation for Examiner's combination is impermissible hindsight

The Examiner proposes that it would have been obvious at the time the invention was made, "to modify the spot drill insert of Stokey, in view of Chaconas et al such that it would provide the spot drill insert of Stokey with the concept of having a land surface having an axis of curvature offset relative to the rotational axis for the

purpose of aiding chip removal and reducing friction between the cutting edges of the drill insert and the inner surface of the drill hole, thereby increasing tool life."

As previously discussed, Stokey fails to disclose, teach or suggest the basic drill point configuration recited in claims 1 and 5. Specifically, Stokey fails to disclose, teach or suggest substantially linear cutting edges formed at the intersection of a substantially planar flute surface and a substantially conical land surface as recited in claims 1 and 5. Starting as it does with a reference that fails to teach the recited point geometry, the Examiner's proposed modification of Stokey fails to teach or suggest all the limitations of the claims.

In addition, there is no motivation in the references themselves or in the knowledge of one of skill in the art that would lead the skilled artisan to modify the angular land surfaces of the Stokey drill insert by reference to the arcuate (but not conical) surfaces disclosed in Chaconas. Those skilled in the art and familiar with the machining processes employed to grind the planar relief surfaces and concave arcuate web thinning notches of Stokey would not be motivated to seek out or employ the machining processes necessary to produce the curved and offset surfaces disclosed in Chaconas. Further, Stokey specifically addresses the issues of relief and chip removal and contains no suggestion that the disclosed insert could benefit from the modification suggested by the Examiner. In fact, the only motivation for the suggested combination is found in an **impermissible hindsight reference** to Applicant's specification and claims.

The Examiner's proposed combination of Stokey and Chaconas fails to provide a *prima facie* case of obviousness under 35 USC §103 because:

1. The Examiner's proposed combination finds no motivation either in the references themselves or in the knowledge of one skilled in the art; and
2. Even if combined, the drill insert of Stokey modified as suggested by the Examiner does not disclose all the limitations of claims 1 – 4 and 6.

Claims 1 – 4 and 6 are patentable over the Examiner's proposed combination of Stokey and Chaconas.

For all the foregoing reasons, Applicant respectfully requests allowance of claims 1 – 9.

Respectfully submitted,

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